



# The *Trivia spongicola* complex, with the description of a new species (Caenogastropoda; Triviidae)

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**KEY WORDS:** *Trivia*, new species, taxonomy, Eastern Mediterranean Sea.

**RIASSUNTO** Viene descritta *Trivia levantina* n. sp. sulla base dei soli caratteri conchigliari. La nuova specie, che al momento sembra essere geograficamente confinata nel bacino mediterraneo levantino, è stata raccolta in sedimenti provenienti dalle coste turche del Mar Egeo e dalle coste cipriote, ed è posta nel genere *Trivia* Gray J. E., 1837. Data la presenza nella teleoconca di *T. levantina* di un solco dorsale ben evidente, caratteristica presente anche in *Trivia spongicola* Monterosato, 1923, si sono confrontati rappresentanti delle due entità tassonomiche. L'osservazione del materiale tipico di *T. spongicola* ha consentito di confermare la sua validità specifica e la sua separazione dal nuovo taxon. Al momento questa specie è stata segnalata solo per le coste mediterranee africane, mostrando un areale di distribuzione molto limitato (coste tunisine e libiche). Dal materiale fossile usato per confronto è illustrata *Trivia subaffinis* (Brugnone, 1880), specie Pliocenica che mostra una certa rassomiglianza con il nuovo taxon.

**ABSTRACT** *Trivia levantina* n. sp. is here described from samples collected along the Turkish coasts of the Aegean Sea and the Cypriot coasts. The new species is known from shells only and it has been placed in the genus *Trivia* Gray J. E., 1837. *Trivia spongicola* Monterosato, 1923 is compared to the new taxon and confirmed to be a distinct and valid species, so far only reported from the Mediterranean african coasts. From fossil material is compared and figured *Trivia subaffinis* (Brugnone, 1880).

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## INTRODUCTION

According to recent Check-lists (SABELLI et al., 1990, 1992) in the Mediterranean Sea the genus *Trivia* Gray J. E., 1837 is represented by five species: *Trivia arctica* (Pulteney, 1789), *Trivia monacha* (Da Costa, 1778), *Trivia multilirata* (Sowerby G. B. II, 1870), *Trivia pulex* (Solander in Gray J. E., 1828) and *Trivia spongicola* Monterosato, 1923. The last taxon was indeed discussed by SABELLI et al. (1992) as a doubtful species: "Doubtful species. Characteristic form of the North-African coastal platform." (Annotated Check-list of Mediterranean Marine mollusks, vol. 2, p. 383). Later on, *T. spongicola* was figured and considered as a valid species by GIANNUZZI-SAVELLI et al. (1996). The amphiatlantic *Pusula candidula* (Gaskoin, 1836) (FERNANDEZ & ROLAN, 1994), a Triviidae Troschel, 1863 at the present ranked in the genus *Pusula* Jousseaume, 1884, is also present in the Mediterranean Sea, albeit its occurrence is restricted to the Alboran Sea and Mediterranean african coasts (SABELLI et al., 1990, 1992; GIANNUZZI-SAVELLI et al., 1996). During the screening of material dredged from the Eastern Mediterranean Sea, collected along the Turkish (Aegean Sea) and Cypriot coasts, we had the opportunity to find several specimens, lacking soft parts, of a medium-size Triviidae, which was not possible to classify among the Mediterranean species of this family. Since the presence of a medium-dorsal sulcus in the shell of the specimens under investigation, a conchological feature also shown by the teleoconch of *T. spongicola*, we compared material of these two groups of triviid populations. The morpholo-

gical analysis has revealed that the shells are clearly distinguishable, furthermore the type material of *T. spongicola* has confirmed its taxonomical validity. A comparison to other members of the family, fossil and Recent from different geographical areas, has failed to find any species identical to this new taxon, which it is named *Trivia levantina* n. sp. and is proposed to science. From the compared fossil material analyzed, we selected and figured *Trivia subaffinis* (Brugnone, 1880), a Pliocene species close to *T. levantina*. A schematic representation of the triviid shell morphology is given in Figs 1-2 for an easier interpretation of the teleoconch features described in the text.

## Systematics

Family	Triviidae Troschel, 1863
Subfamily	Triviinae Troschel, 1863
Genus	<i>Trivia</i> Gray J. E., 1837

## *Trivia spongicola* Monterosato, 1923

### Material examined

The type material of *T. spongicola* analyzed is 1 lectotype (designated here in this paper), 7.0 x 4.8 mm, and 5 paralectotypes from Sfax (Tunisia): A, 8.0 x 6.1 mm; B, 10.4 x 7.3 mm; C, 8.0 x 5.8 mm; D, 6.0 x 4.4 mm; E, 8.8 x 6.4 mm; including original label in Monterosato's handwriting; Monterosato collection MCZ, Rome, Italy. 3 paralectotypes from Sfax (Tuni-



sia): F, 8.5 x 6.0 mm; G, 8.0 x 5.4 mm; H, 7.6 x 5.3 mm; original label in Monterosato's handwriting; (HUJ 21118), ex Coen-collection 4428, National Mollusc Collection HUJ, Jerusalem, Israel.

Other material examined of *T. spongicola* is: 4 shells from Jerba Island (Tunisia), 3 m depth, collected in sandy sediment near *Posidonia oceanica* (L.) Delile beds: A, 7.5 x 5.4 mm; B, 7.0 x 5.0 mm; C, 8.0 x 5.3 mm; D, 8.2 x 5.9 mm; coll. Giovanni Buzzurro, Monza (MI), Italy. 1 shell from Jerba Island (Tunisia), 10 m depth: 8.4 x 6.0 mm; coll. Paolo Mariottini, Rome, Italy.

### Original description

*T. spongicola*, Monts. - I primi esemplari furono scoperti nelle spugne di Sfax, pellucidi, vinitinti e poco caratteristici, per cui attribuiti ad altre forme Mediterranee. Ora ne ho ritrovato esemplari di *Zuetina* che mostrano la loro scultura tutta propria ed il solco dorsale ben appariscente e differiscono da *T. Mollerati*, *coralligena* e dei fondi fangosi. E' più allungata di questa e meno globosa. Rari esemplari.

### Distribution

*T. spongicola* has been reported only from the African coasts of the Eastern Mediterranean Sea (MONTEROSATO, 1923; SABELLI et al., 1990, 1992; GIANNUZZI-SAVELLI et al., 1996).

### Remarks

Type material of *T. spongicola* belonging to the Monterosato collection held in the Museo Civico di Zoologia di Roma, Italy, was examined (Figs 3-12). Furthermore, thanks to the highly appreciated help of Dr. Henk Mienis, Curator of the National Mollusc Collection of the Hebrew University of Jerusalem, Israel, we were able to examine three syntypes of *T. spongicola* belonging to the ex-Coen collection deposited in that museum (Figs 13-19). This has led us to identify undoubtedly other specimens within our private collections (see Material examined). We like to revalue the status of *T. spongicola* as a valid species living in the Mediterranean Sea and only known, to our knowledge, from the coast of Tunisia (Sfax and Jerba) and Lybia (Zuwaytinah). We have designated a lectotype of *T. spongicola* from the type material of the Monterosato collection. We like to mention that in all the type material examined, inside the shells, we could observe debris and fragments of sponges, a fact that led Monterosato to name this species *spongicola* = inhabitant of sponges (although it probably lives feeding on some Tunicate, as all Triviidae, and possibly it is not a truly inhabitant of sponges). In line with that, there is the interesting finding of a conspicuous number of *T. spongicola* freshly beached together *P. oceanica* on a sandy coast of Jerba Island by Mr Gian Antonio Valenti (personal communication). The possible habitat of this species could be the biocoenosis associated to *P. oceanica* beds of the infralittoral zone [Biocoenose de l'Herbier de Posidonies, HP, *sensu* PÈRÈS & PICARD (1964)]. We have observed a great variability in the shell dorsum colour, which ranges from pale yellow-beige to red brown, while ventrally is always milky white.

### *Trivia levantina* n. sp.

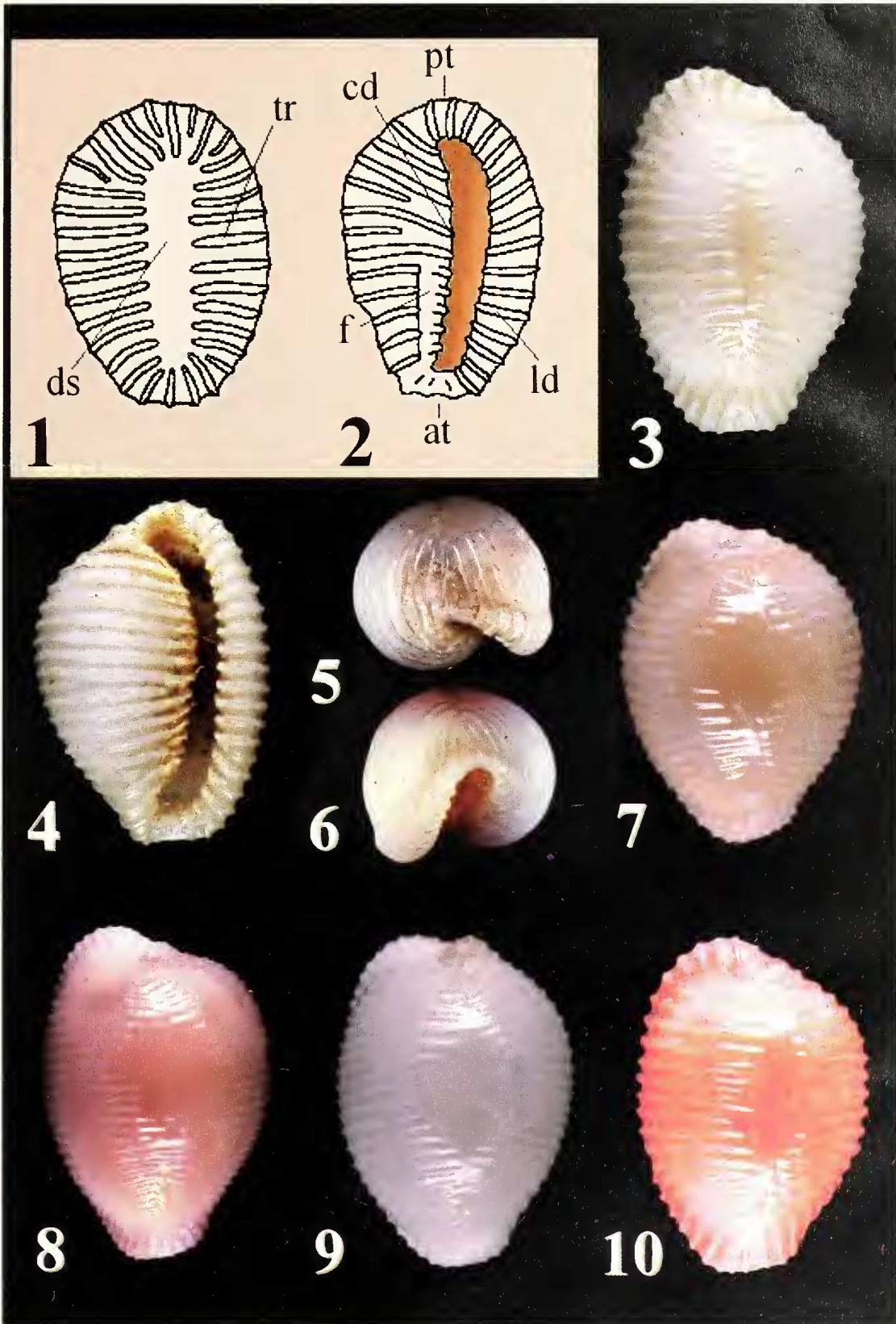
#### Material examined

The type material of *T. levantina* consists in the following shells. The holotype, 6.5 x 4.6 mm, from Bozcaada Island, Dardanelles (Turkey), collected alive, 20 m depth, rocky bottom, is deposited in the malacological collection of the Museo di Zoologia dell'Università di Bologna (MZB), Italy, with the number 12011. Paratypes are deposited in private collections as follows, 5 shells from Bozcaada Island, Dardanelles (Turkey), 10 m depth, rocky bottom: A, 8.4 x 6.0; B, 7.5 x 5.4 mm; C, 7.0 x 5.0 mm; D, 8.8 x 6.4 mm; E, 8.4 x 5.8 mm; coll. Carlo Smriglio, Rome, Italy. 1 shell from Tenedos, Bozcaada Island, Dardanelles (Turkey), collected beached on sandy shore: F, 7.5 x 5.3 mm; coll. Giovanni Buzzurro, Monza (MI), Italy. 1 shell from Tenedos, Bozcaada Island, Dardanelles (Turkey), collected beached on sandy shore: G, 6.7 x 4.7 mm; coll. Winfried Engl, Düsseldorf, Germany. 2 shells from Seddulbahir, Dardanelles (Turkey), 12 m depth, rocky bottom: H, 7.9 x 5.5 mm; I, 9.2 x 6.5 mm; coll. Paolo Mariottini, Rome, Italy. 1 shell from Tas Bay, Imroz Island, Dardanelles (Turkey), 32 m depth, collected alive under rocks by SCUBA-diving: J, 7.0 x 5.0 mm; coll. Stefano Chiarelli, Porto Garibaldi (FE), Italy.

Other material examined of *T. levantina* is: 3 shells from Ahya Napa, Famagusta (Cyprus), 4 m depth, coarse sediment near rocks: A, 6.5 x 4.5 mm; B, 6.4 x 4.4 mm; C, 6.8 x 4.8 mm; coll. Giovanni Buzzurro, Monza (MI), Italy. 1 shell from Salamis, Famagusta (Cyprus), 4 m depth: D, 7.0 x 5.0 mm; coll. Stefano Chiarelli, Porto Garibaldi (FE), Italy.

#### Shell description

Shell ovately cylindrical, moderately pyriform, slightly broader at shoulder than anteriorly. Shells range from 6.4 to 7.5 mm in length, the holotype (Figs 20-23) measures 6.5 mm in length, 4.6 in width and 4.2 in height. The broad medially thickened labrum extends slightly beyond the lateral profile on the body whorl and bears 17-18 coarse labral denticles (ld) (18 in the holotype). These denticles are equally spaced on the inner edge, they continue over the shell dorsum, as uninterrupted transverse ribs (tr), only rarely interrupted. They range in the number of 20-25 (20 in the holotype) and terminate reaching the medio-dorsal depression. In general, the sulcus is very pronounced, but in some shells is less evident and in these cases the ribs only flatten smoothly to reappear at the edges of it. The dorsal ribs cross the body shell and reach the columella. The peristome bears 14-16 columellar denticles (cd) (14 in the holotype) and shows a very pronounced fossula which extends on about half of the aperture. This is narrow, uniformly spaced along its length and recurved at both extremities. Mature shells have a concealed spire and the posterior terminal is covered with ribs which radiate from the medio-dorsal sulcus, young specimens show a protruding spire. Colour pattern very constant, glossy, red-brown dorsally, columella and labrum milky white with the anterior and posterior terminals pink, the transverse ribs dorsally are pale beige, resulting more evident, almost whitish, on the anterior and posterior terminals.



Figures 1-2 - Shell morphology of triviids. Nomenclature adopted: at, anterior terminal; cd, columellar denticles; ds, dorsal sulcus; f, fossula; ld, labral denticles; pt, posterior terminal; tr, transverse ribs. Figures 3-6 - *T. spongicola*. Lectotype. Dorsal, apertural, posterior terminal and anterior terminal views. 7.0 x 4.8 mm. Sfax (Tunisia). MCZ collection (Italy). Figures 7-10 - *T. spongicola*. Paralectotypes. Dorsal views. 7 - A, 8.0 x 6.1 mm; 8 - B, 10.4 x 7.3 mm; 9 - C, 8.0 x 5.8 mm; 10 - D, 6.0 x 4.4 mm. Sfax (Tunisia). MCZ collection (Italy).



Figure 11 - *T. spongicola*. Paralectotype E. Dorsal view, 8.8 x 6.4 mm. Sfax (Tunisia). MCZ collection (Italy). Figure 12 - Original label in Monterosato's handwriting. Figures 13-16 - *T. spongicola*. Paralectotypes. Dorsal and apertural views. 13, 14 - F, 8.5 x 6.0 mm; 15 - G, 8.0 x 5.4 mm; 16 - H, 7.6 x 5.3 mm. Sfax (Tunisia). HUI collection (Israel). Figure 17 - Original label in Coen's handwriting. Figure 18 - Original label in Monterosato's handwriting. Figure 19 - HUI museum label.



Figures 20-23 - *T. levantina*. Holotype. Dorsal, apertural, posterior terminal and anterior terminal views. 6.5 x 4.6 mm. Bozcaada Island, Dardanelles (Turkey), 20 m depth. MZB collection (Italy). Figures 24-28 - *T. levantina*. Paratypes. Dorsal views. 24 - A, 8.4 x 6.0 mm; 25 - B, 7.5 x 5.4 mm; 26 - C, 7.0 x 5.0 mm; 27 - D, 8.8 x 6.4 mm; 28 - E, 8.4 x 5.8 mm. Bozcaada Island, Dardanelles (Turkey), 10 m depth. Figure 29 - *T. levantina*. Paratype F. Dorsal view. 7.5 x 5.3 mm. Bozcaada Island, Dardanelles (Turkey), beached.

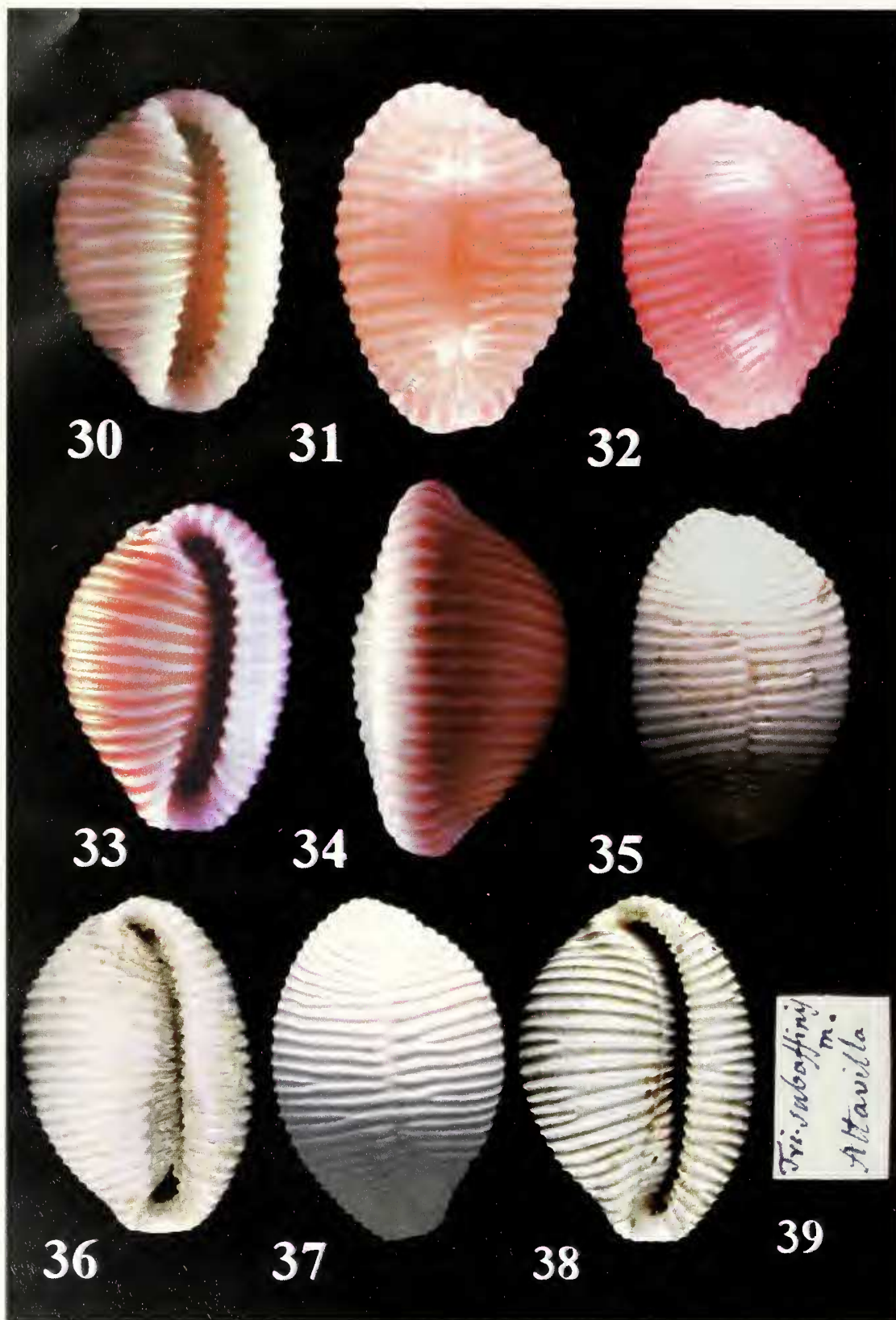


Figure 30 - *T. levantina*. Paratype F. Apertural view. 7.5 x 5.3 mm. Bozcaada Island, Dardanelles (Turkey), beached. Figures 31-32 - *T. levantina*. Paratypes. Dorsal views. 31 - H, 7.9 x 5.5 mm; 32 - I, 9.2 x 6.5 mm. Seddulbahir, Dardanelles (Turkey), 12 m depth. Figures 33-34 - *T. levantina*. Paratype J. Apertural and lateral views. 7.0 x 5.0 mm. Imroz Island, Dardanelles (Turkey), 32 m depth. Figures 35-36 - *T. subaffinis*. Lectotype. Dorsal and apertural views. 10.3 x 6.8 mm. Altavilla, Sicily (Italy). MCZ collection (Italy). Figures 37-38 - *T. subaffinis*. Paralectotype A. Dorsal and apertural views. 8.5 x 6.0 mm. Altavilla, Sicily (Italy). MCZ collection (Italy). Figure 39 - Original label in Brugnone's handwriting.



## Etymology

The specific name *levantina* refers to the area of the Mediterranean Sea where the type material has been collected, namely the Levant area.

## Type locality

Bozcaada Island, Dardanelles (Turkey), Aegean Sea.

## Habitat

Since *T. levantina* has been mainly collected from hard bottoms of the infralittoral zone by diving and dredging, it presumably belongs to the biocoenosis AP (Algues Photophiles) *sensu* PÉRÈS & PICARD (1964).

## Distribution

Only known from the Mediterranean Sea (Aegean Sea, Cypriot and Syrian coasts).

## Remarks

*T. levantina* is conchologically unique and clearly distinguishable from all other Mediterranean triviids (Figs 20-34). The only Mediterranean species which shows a distinct medio-dorsal depression is *T. spongicola*. At a first sight *T. spongicola* can be indeed confused with the new taxon, this is the reason why some authors in the past have misidentified and reported *T. levantina* as *T. spongicola*. The analysis of the type material of *T. spongicola* has revealed that it has a different shell morphology when compared to the one of *T. levantina*. The new taxon has a more solid and cylindrical shell, less protruding at terminals, a lower average number of total ribs (17-18 ld, 14-16 cd and 20-25 tr; while *T. spongicola* has 18-21 ld, 17-23 cd and 21-32 tr, respectively), a more pronounced fossula and a narrower aperture (these last features are clearly visible in the adult shells). In spite of the fact that the two taxa can show identical colours, the distribution pattern of these is constantly different. The dorsum and transverse ribs of *T. spongicola* are always uniformly coloured, on the contrary in *T. levantina* transverse ribs are lighter than the background. We could observed some specimens of *T. spongicola* coloured red-brown dorsally with a distinct narrow pink band along the edge of the labrum which is uniformly milky white, but we have never observed the typical pattern of *T. levantina*. The possibility that the new taxon represents an additional lessepsian migrant species, originating in the Red Sea, has been also taken into account. We have been unable to find *T. levantina* neither in the literature nor within the collections of Red Sea shells that so far we had the chance to examine. Furthermore, comparison with fossil species of Triviidae reported for the Mediterranean area has revealed no other ones identical to the new taxon. *T. levantina* superficially resembles *Trivia subaffinis* (Brugnone, 1880), a Pliocene species originally described from some fossile marine sediments located near Caltanissetta, Sicily (Italy), and figured by SETTEPASSI (1971). The two species are easily distinguishable on the grounds that *T. subaffinis* is more ovoidly pyriform and clearly less cylindrical than *T. levantina*; furthermore, it has a

higher average number of total ribs (24-28 ld, 18-22 cd and 26-30 tr), the sulcus is not continuous being seldom interrupted by transverse ribs, the aperture is narrower, the posterior and anterior turns and the fossula are less pronounced. From the lines of evidence here described, we assume that *T. levantina* is an undescribed Mediterranean species. Regarding its systematic position at the level of generic rank, we agree with LILTVED (1989 and refs. therein) who has emphasized the need to gain more information on the family Triviidae before subdividing it into genera, since the taxonomy of this group suffers conflicting data mainly due to the lack of anatomical studies. In line with that, we think that at the present no definitive systematic statement can be made at generic level in this family and since the new species is only known from shells, it has been conservatively placed in the genus *Trivia* Gray J. E., 1837. As mentioned above, *T. levantina* has been already reported twice in the past. The first time by NICOLAY & ANGIOY (1991: fig. 1, p. 4), but the shells were misidentified as *T. spongicola*. The authors figured three specimens from Dardanelles and described a variable colour pattern of the animal, which is not surprising within the family Triviidae (LILTVED, 1989). The second report of *T. levantina* was by GIANNUZZI-SAVELLI et al. (1996: figs 665a-c, p. 160), the new taxon was figured as *Trivia* sp., one specimen from Saros (Greece), Dardanelles area. Furthermore, Dr Serge Gofas (Muséum National d'Histoire Naturelle, Laboratoire B.I.M.M., Paris) kindly communicated to us that material reported by PALLARY (1938) as *T. pulex* from the Syrian coasts, is indeed *T. levantina* (in litt., 3 shells from Lattaquieh, 12 shells from Tartous and 2 shells, specimens ??, from Salhata ?). All these records confirm the limited geographical distribution of this species, which is at the present, as far as we know, spotted in the most northern and eastern parts of the Mediterranean Sea (Fig. 40).

## *Trivia subaffinis* (Brugnone, 1880)

### Type material

The lectotype (designated here in this paper), 10.3 x 6.8 mm, and 4 paralectotypes from Altavilla, Sicily (Italy): A, 8.5 x 6.0 mm; B, 9.1 x 5.2 mm; C, 8.1 x 5.0 mm; D, 8.1 x 5.2 mm. Monterosato collection MCZ, Rome, Italy.

### Shell description

Shell ovately cylindrical, with slightly protruding terminals, ranging from 8.1 to 10.3 mm in length, 5.0 to 6.8 mm in width. The labrum is broad with 24-28 closely spaced labral denticles along the inner edge. The entire body whorl had a dense even covering of fine transverse ribs, ranging from 26 to 30 in number, which are generally interrupted by a medio-dorsal sulcus, only rarely they are not. The ribs cross the body shell and continue on to the columella within the aperture. The peristome bears 18-22 columellar denticles, the fossula is moderately wide. Aperture narrow, medially straight, recurved at terminals, slightly wider anteriorly.



## Remarks

Type material has been found in the Monterosato collection (Figs 35-38), with the original label in Brugnone's handwriting (Fig. 39). We have designated a lectotype of *T. subaffinis*. We have been unable to find the original description of this species in the literature, it was figured and cited as such, to our knowledge, only by SETTEPASSI (1971). At the present we can not clarify the taxonomic status of *T. subaffinis*. The morphology of this Pliocene species is close to *T. levantina*, but the two taxa are easily distinguishable (see Remarks of *T. levantina*).

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## REFERENCES

- FERNANDEZ F. & ROLÁN E., 1994. *Check-list of the amphiatlantic mollusca based on a revision of the literature. Resenas Malacologicas. VII.* Sociedad Espanola de Malacologia, Madrid, 36 pp.
- GIANNUZZI-SAVELLI R., PUSATERI F., PALMERI A. & EBREO C., 1996. *Atlante delle Conchiglie Marine del Mediterraneo. Vol. 2. "La Conchiglia"*, Roma, 258 pp.
- LILTVED W. R., 1989. *Couries and their relatives of Southern Africa.* Gordon Verhoef, Seacomber Publications, 208 pp.
- MONTEROSATO T. A., 1923. Molluschi delle coste Cirenaiche raccolti dall'ing. Camillo Crema. *Reale Comitato Talassografico Italiano Memorie*, Venezia, 106: 3-14.
- NICOLAY K. & ANGIOY M., 1991. Una specie elusiva (An elusive species) *Trivia spongicola* Monterosato, 1923. *La Conchiglia*, Roma, XXII (259): 4.
- PALLARY P., 1938. Les Mollusques Marins de la Syrie. *Journal de Conchyliology*, Paris, 82: 5-28.
- PÉRÉS J. M. & PICARD J., 1964. Nouveau Manuel de Bionomie Benthique de la Mer Méditerranée. *Recueil des Travaux de la Station Marine d'Endoume*, 31 (47): 1-137.
- SABELLI B., GIANNUZZI-SAVELLI R. & BEDULLI D., 1990. *Catalogo Annotato dei Molluschi Marini del Mediterraneo. Vol. 1.* Libreria Naturalistica Bolognese, Bologna, 348 pp.
- SABELLI B., GIANNUZZI-SAVELLI R. & BEDULLI D., 1992. *Catalogo annotato dei Molluschi marini del Mediterraneo. Vol. 2.* Libreria Naturalistica Bolognese, Bologna, 150 pp.
- SETTEPASSI F., 1971. *I Molluschi marini nel Mediterraneo. Vol II.* Tipografia Inivag, Roma, 149 pp.

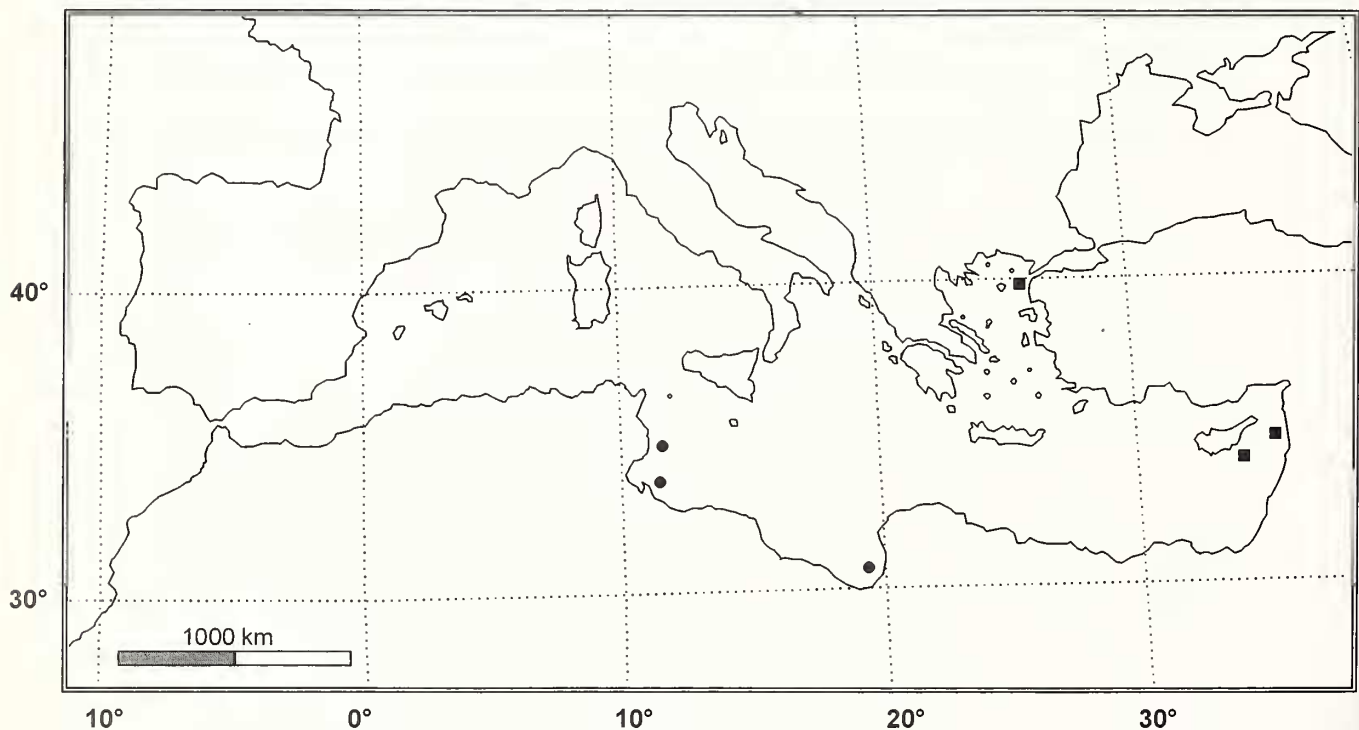


Figure 40 - Geographical distribution of shell records of *T. levantina* (■) and *T. spongicola* (●) in the Mediterranean Sea.